

## CLAIMS

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5     What is claimed is:

1 . A hydrogen storage material comprising a first region composed primarily of an amorphous carbon containing at least one metal element selected from the group consisting of Ti, Zr, Hf and Y, and a second region composed primarily of an amorphous carbon having a density lower than that of the first region.

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2 . A hydrogen storage material comprising a void present in an amorphous carbon containing at least one metal element selected from the group consisting of Ti, Zr, Hf and Y.

3 . The hydrogen storage material of claim 1 or 2 wherein the content of the metal element is  
15     from 0.02 to 30 atomic %.

4 . The hydrogen storage material of any one of claims 1 to 3 which is in the form of a film, and wherein the second region or the void extends to a   thickness direction of the film.

20     5 . A process for the preparation of hydrogen storage materials which comprises providing a source of carbon containing at least one metal element selected from the group consisting of Ti, Zr, Hf and Y, and forming a film composed of an amorphous carbon containing said metal element on the surface of a base material at a temperature of 773 K or less according to a gas phase synthesis.

25     6 . A process for the preparation of hydrogen storage materials which comprises providing a source of carbon containing at least one metal element selected from the group consisting of Ti, Zr, Hf and Y, and forming a film composed of an amorphous carbon containing said metal element on the surface of a base material under a process gas pressure of 1.33322 Pa or more according to a sputtering process.